

TCAP High School End of Course Science

High School EOC Testing Structure in Biology I and Chemistry I

As in the past, each year the state assessment includes both operational and field test items. The below testing structure for science reflects both the number of operational assessment items and the number of field test assessment items.

Course	Session 1
Biology I	75 minutes <ul style="list-style-type: none"> • 60 multiple-choice items
Chemistry I	75 minutes <ul style="list-style-type: none"> • 60 multiple-choice items

High School EOC Blueprints in Biology I and Chemistry I

The blueprints below reflect *only* operational assessment items. You can find both the Biology I and Chemistry I standards [here](#).

Biology I			
	# of Items	# of Score Points	% of Test
Content			
• Inquiry and Technology & Engineering	5-10	5-10	9-18
• Cells	11-13	11-13	20-24
• Interdependence	6-7	6-7	11-13
• Flow of Matter and Energy	9-10	9-10	16-18
• Heredity	11-14	11-14	20-25
• Biodiversity & Change	6-7	6-7	11-13
TOTAL	50	50	100

Chemistry I			
	# of Items	# of Score Points	% of Test
Content			
• Inquiry and Technology & Engineering	8-10	8-10	14-18
• Atomic Structure	9-11	9-11	16-20
• Matter and Energy	14-16	14-16	25-29
• Interactions of Matter	20-22	20-22	36-40
TOTAL	50	50	100

Science Calculator Use

The use of a calculator is not permissible for grades 3-8 or Biology without documentation in a student's IEP.

For Chemistry, calculator use is recommended. Sharing calculators during testing is not permitted. The following types of calculators/devices may **NOT** be used during the test:

- pocket organizers
- electronic writing pads or input devices
- Some examples of prohibited calculators are:
 - Casio models: CFX-9970G, Algebra FX 2.0
 - Hewlett-Packard models: HP-40G, HP-49G
 - Texas Instruments models: TI-89, TI-92, Voyage 200, TI-INSPIRE – the CAS version (The non-CAS version of TI-INSPIRE is allowable.)
- Calculators that can communicate (transfer data or information) wirelessly with other student calculators/devices
- Cell phones, PSPs, and/or iPods

Students may use any four-function, scientific, or graphing calculator that does not have any of the above features. The use of devices that have a Computer Algebra System (CAS) is **NOT** allowed.

Chemistry Reference Sheet

Periodic Table of the Elements

		Key													18				
		Average Atomic Mass *																	
		Element Name																	
		Element Symbol																	
		Atomic Number																	
1	1	H Hydrogen 1.008	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
2	2	He Helium 4.003	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3	3	Li Lithium 6.941	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
4	4	Be Beryllium 9.012	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
5	5	B Boron 10.811	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
6	6	C Carbon 12.011	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
7	7	N Nitrogen 14.007	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
8	8	O Oxygen 15.999	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
9	9	F Fluorine 18.998	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
10	10	Ne Neon 20.180	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
11	11	Na Sodium 22.990	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
12	12	Mg Magnesium 24.305	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
13	13	Al Aluminum 26.982	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
14	14	Si Silicon 28.086	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
15	15	P Phosphorus 30.974	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	16	S Sulfur 32.066	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
17	17	Cl Chlorine 35.453	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
18	18	Ar Argon 39.948	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
19	19	K Potassium 39.098	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
20	20	Ca Calcium 40.078	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
21	21	Sc Scandium 44.956	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
22	22	Ti Titanium 47.867	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
23	23	V Vanadium 50.942	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
24	24	Cr Chromium 51.996	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
25	25	Mn Manganese 54.938	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
26	26	Fe Iron 55.845	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
27	27	Co Cobalt 58.933	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
28	28	Ni Nickel 58.693	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
29	29	Cu Copper 63.546	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
30	30	Zn Zinc 65.409	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
31	31	Ga Gallium 69.723	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
32	32	Ge Germanium 72.610	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
33	33	As Arsenic 74.922	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
34	34	Se Selenium 78.960	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
35	35	Br Bromine 79.904	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
36	36	Kr Krypton 83.800	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
37	37	Rb Rubidium 85.468	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
38	38	Sr Strontium 87.620	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
39	39	Y Yttrium 88.906	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
40	40	Zr Zirconium 91.224	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
41	41	Nb Niobium 92.906	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
42	42	Mo Molybdenum 95.940	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
43	43	Tc Technetium (98)	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
44	44	Ru Ruthenium 101.070	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
45	45	Rh Rhodium 102.906	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62
46	46	Pd Palladium 106.420	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
47	47	Ag Silver 107.868	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
48	48	Cd Cadmium 112.411	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
49	49	In Indium 114.818	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
50	50	Sn Tin 118.710	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67
51	51	Sb Antimony 121.760	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
52	52	Te Tellurium 127.600	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69
53	53	I Iodine 126.904	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
54	54	Xe Xenon 131.290	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
55	55	Cs Cesium 132.905	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
56	56	Ba Barium 137.327	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
57	57	La Lanthanum 138.905	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
58	58	Ce Cerium 140.120	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
59	59	Pr Praseodymium 140.908	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
60	60	Nd Neodymium 144.242	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77
61	61	Pm Promethium (145)	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
62	62	Sm Samarium 150.360	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
63	63	Eu Europium 151.964	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
64	64	Gd Gadolinium 157.250	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
65	65	Tb Terbium 158.925	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82
66	66	Dy Dysprosium 162.500	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
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Chemistry Reference Page

Formulas, Constants, and Unit Conversions

Formulas	
Change in Enthalpy (Heat): $Q = m(\Delta T)c_p$	Heat of Fusion: $Q = m\Delta H_{fus}$
Ideal Gas Law: $PV = nRT$	Heat of Vaporization: $Q = m\Delta H_{vap}$
Density: $d = \frac{m}{V}$	Molarity (M) = $\frac{\text{mol of solute}}{\text{L of solution}}$
Combined Gas Law: $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$	Molality (m) = $\frac{\text{mol of solute}}{\text{kg of solvent}}$
Boiling Point Elevation: $\Delta T_b = k_b \times m$	Freezing Point Depression: $\Delta T_f = k_f \times m$

Constants	
Universal Gas Constant (R): $0.0821 \frac{\text{atm} \times \text{L}}{\text{mol} \times \text{K}}$, or equal to $8.31 \frac{\text{kPa} \times \text{L}}{\text{mol} \times \text{K}}$	
Molar Volume at STP: $22.4 \frac{\text{L}}{\text{mol}}$	Avogadro's Number (1 mole): 6.02×10^{23}
Specific Heat Capacity of Liquid Water: $c_p (\text{H}_2\text{O}) = 1.00 \frac{\text{cal}}{\text{g} \times ^\circ\text{C}} = 4.18 \frac{\text{J}}{\text{g} \times ^\circ\text{C}}$	

Unit Conversions	
1 atm = 760 mm Hg = 760 Torr = 101.3 kPa = $14.7 \frac{\text{lb}}{\text{in}^2} = 29.92 \text{ in. Hg}$	$\text{K} = ^\circ\text{C} + 273$
1.000 calorie = 4.184 Joules	1 mL = 1 cm ³ 1 L = 1,000 mL = 1,000 cm ³
giga (G) = 10 ⁹ , mega (M) = 10 ⁶ , kilo (k) = 10 ³ , hecto (h) = 10 ² , deka (da) = 10 ¹	
deci (d) = 10 ⁻¹ , centi (c) = 10 ⁻² , milli (m) = 10 ⁻³ , micro (μ) = 10 ⁻⁶ , nano (n) = 10 ⁻⁹	

Common Ions					
Element Name	Charges	Ions	Charges	Ions	Charges
Silver (Ag ¹⁺)	1+	Ammonium (NH ₄ ⁺)	1+	Oxide (O ²⁻)	2-
Zinc (Zn ²⁺)	2+	Nitrate (NO ₃ ⁻)	1-	Sulfide (S ²⁻)	2-
Scandium (Sc ³⁺)	3+	Nitrite (NO ₂ ⁻)	1-	Sulfate (SO ₄ ²⁻)	2-
Copper (Cu ¹⁺ , Cu ²⁺)	1+, 2+	Hydrogen Carbonate (HCO ₃ ⁻)	1-	Sulfite (SO ₃ ²⁻)	2-
Gold (Au ¹⁺ , Au ³⁺)	1+, 3+	Perchlorate (ClO ₄ ⁻)	1-	Carbonate (CO ₃ ²⁻)	2-
Cobalt (Co ²⁺ , Co ³⁺)	2+, 3+	Chlorate (ClO ₃ ⁻)	1-	Peroxide (O ₂ ²⁻)	2-
Nickel (Ni ²⁺ , Ni ³⁺)	2+, 3+	Chlorite (ClO ₂ ⁻)	1-	Chromate (CrO ₄ ²⁻)	2-
Lead (Pb ²⁺ , Pb ⁴⁺)	2+, 4+	Hypochlorite (ClO ⁻)	1-	Dichromate (Cr ₂ O ₇ ²⁻)	2-
Tin (Sn ²⁺ , Sn ⁴⁺)	2+, 4+			Phosphate (PO ₄ ³⁻)	3-
Mercury (Hg ¹⁺ , Hg ²⁺)	1+, 2+				
Iron (Fe ²⁺ , Fe ³⁺)	2+, 3+				
Titanium (Ti ²⁺ , Ti ³⁺ , Ti ⁴⁺)	2+, 3+, 4+				
Chromium (Cr ²⁺ , Cr ³⁺)	2+, 3+				
Vanadium (V ²⁺ , V ³⁺ , V ⁴⁺)	2+, 3+, 4+				
Manganese (Mn ²⁺ , Mn ³⁺ , Mn ⁴⁺)	2+, 3+, 4+				

Turn over for Periodic Table of the Elements